

REMARKS/ARGUMENTS

In response to the Office Action dated March 25, 2004, claims 4, 6-11, 13-16, 19-22, 25, 26 and 28-38 are amended, and claims 39-49 are added. Claims 4-23, 25, 26 and 28-50 are now active in this application. No new matter has been added.

The indication that claims 5, 17, 18 and 23 are allowable, that claims 6, 7, 25, 26, 29, 30 and 36-38 contain allowable subject matter, and that claims 21 and 22 would be allowable if rewritten or amended to overcome noted indefiniteness is acknowledged and appreciated.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 112, FIRST PARAGRAPH

Claims 21 and 22 are rejected under 35 U.S.C. §112, first paragraph, as the specification does not enable any person skilled in the art to which the invention pertains to make the invention commensurate in scope with these claims. The Examiner asserts that the specification, while being enabling for a carrier generation/multiplication layer composed of amorphous silicon to have both the function of absorbing light and generating carriers through optical excitation and the function of multiplying the generated carriers, does not reasonably provide enablement for a carrier generation/multiplication layer composed of amorphous silicon carbide of p-type conductivity to inhibit injection of electrons into the carrier generation/multiplication layer.

To expedite prosecution, claims 21 and 22 are amended to recite:

said carrier generation/multiplication layer is composed of an amorphous silicon carbide of the p-type conductivity to inhibit injection of electrons into the carrier generation/multiplication layer to have both the function of absorbing light and generating carriers through optical excitation and the function of multiplying the generated carriers, ...

which is supported by the specification. Therefore, it is respectfully urged that the rejection be withdrawn.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 103

I. Claims 4, 10, 15 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takasaki et al. (USPN 4,980,736) in view of Kozuka et al. (Translation of JP 09-102627) and Deane et al. (USPN 6,064,091).

Claims 8 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takasaki et al. in view of Kozuka et al. and Deane et al., as applied to claim 4, and further in view of Norström (USPN 6,077,752).

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Takasaki et al. in view of Kozuka et al. and Deane et al., as applied to claim 4, and further in view of Nakayama et al. (USPN 6,157,072).

Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Takasaki et al. in view of Kozuka et al. and Deane et al., as applied to claim 4, and further in view of Fukuda et al. (USPN 5,635,327).

Claims 13, 14, 16, 19, 20 and 31-34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takasaki et al. in view of Kozuka et al.

II. Kozuka et al., used to reject each of the claims, describes a reach-through type avalanche multiplication photodiode (APD). In a reach-through type avalanche multiplication photodiode, a carrier generation layer and a carrier multiplication layer are formed separately; i.e., they are separate layers. However, a reach-through avalanche multiplication photodiode is not practical

as mentioned in the present application at last line of "Description of related art". Accordingly, reach-through type is different from the present invention in the point of technology. Given such difference in technology, a person of ordinary skill in the art would not find a teaching as to arrangement of layers in a reach-through type avalanche multiplication photodiode applicable to a single layer carrier generation/multiplication layer composed of amorphous silicon to have both the function of absorbing light and generating carriers through optical excitation and the function of multiplying the generated carriers, unless explicitly suggested in the prior art. More specifically, Kozuka (nor Takasaki et al.) does not disclose or suggest that the arrangement of layers, as disclosed in Kozuka, is applicable to a single layer carrier generation/multiplication layer composed of amorphous silicon to have both the function of absorbing light and generating carriers through optical excitation and the function of multiplying the generated carriers.

Recognizing, after the fact, that a modification would provide an improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an indication of improper application of hindsight considerations. Simplicity and hindsight are not proper criteria for resolving obviousness. *In re Warner*, 379 F.2d 1011, 154, USPQ 173 (CCPA 1967).

It is impermissible simply to engage in hindsight reconstruction of the claimed invention, using applicants' structure as a template and selecting elements from references to fill in the gaps. *In re Gorman*, 18 USPQ2d 1885 (Fed. Cir. 1991).

Clearly, the Examiner merely searched for the claimed features which are not disclosed in Takasaki et al. and suggests combining them with the arrangement of Takasaki et al. only to reject the claims. No portion of either reference is identified by the Examiner as "suggesting the desirability of the modification" suggested. In accordance with the case law precedent noted

above, without either reference disclosing or suggesting the desirability of the modification suggested by the Examiner, the only reasonable conclusion is that the modification is suggested only because applicant discloses and claims this feature. However, Applicants' disclosure may not properly be relied upon to support the ultimate legal conclusion of obviousness under 35 U.S.C. §103. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 227 1 USPQ2d 1593 (Fed. Cir. 1987).

Thus, the rejection is an example of improper hindsight reconstruction of the claimed invention using the present disclosure as a guide. It is, therefore, respectfully submitted that the Examiner has not established the requisite motivation for the proposed combination of references to arrive at the claimed invention. Accordingly, withdrawal of the Examiner's rejection of claims 4, 8-16, 19, 20, 28 and 21-34 under 35 U.S.C. § 103 is respectfully solicited.

At any rate, to expedite prosecution, independent claims 4, 13, 14, 16 and 19 are amended to delineate:

a carrier generation/multiplication layer ..., said carrier generation/multiplication layer being a single layer;

NEW CLAIMS

Claims 39-49 are added. Claim 39 depends from claim 6 and recites features recited in claim 4. More specifically, claims 39 recites:

The photoelectric conversion device as claimed in claim 6, wherein
said carrier generation/multiplication layer is prevented from holes
flowing out thereof and is prevented from electron injection thereto, and
a composition ratio C/Si of said electron injection inhibiting layer is
adjusted appropriately to 1.5 or lower.

Claims 40-46 all depend from claim 39 and respectively correspond to claims 8, 9, 10, 11, 12, 15, 28.

Claims 47 and 48 depend from claim 6 and respectively correspond to claims 13 and 14.

Independent claim 49 is derived from amended claim 6 and delineates, *inter alia*:

discontinuity of an energy level at an interface between said amorphous silicon nitride layer and said amorphous silicon layer on a valence band side is larger than on a conduction band side.

It is believed that claims 39-49 are patentable over the applied prior art references and their allowance is respectfully solicited.

CONCLUSION

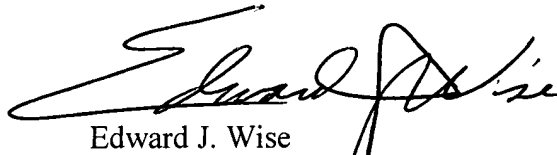
Accordingly, it is urged that the application, as now amended, is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

09/704,539

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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